

## REVISION OF THE GENUS *CALLISCARTA* (HOMOPTERA: CICADELLIDAE: NEOBALINAE)<sup>1</sup>

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**ABSTRACT.**—A taxonomic revision of the Neotropical genus *Calliscarta* Stål is presented. Most of the 19 species treated are described and illustrated, including 10 that are new to science. The new species include: *abrupta* (Bolivia), *acuta* (Peru, Venezuela), *delicata* (Bolivia, Peru), *elongata* (Ecuador, Peru), *expansa* (Bolivia, Ecuador, Peru), *lora* (Peru), *marginata* (Honduras), *mexicana* (Mexico), *ornata* (French Guiana, Venezuela), *rugosa* (Venezuela). Three cases of new synonymy are proposed: *boliviana* (Osborn) (= *tinga* Kramer), *fasciata* (Osborn) [= *brunnea* (Osborn)], *decora* (Fabricius) [= *magnifica* (Osborn)].

The genus *Calliscarta* as reviewed by Linnavuori (1959) included nine species. Two species and the genus *Idiotettix* Osborn were placed in synonymy. Since then Linnavuori and Heller (1961) added one species, and Kramer (1963) added two species. In this study nine of these species are recognized as valid, three are placed in synonymy, and 10 new species are added. The limited number of specimens in collections of this genus make it a very difficult genus with which to deal. No division of this genus is made at this time even though some species groups appear to represent separate genera, such as the *fasciata* group. Much more material will be needed, especially from Central America, to know how to properly place many species. The problem of having only one sex of the majority of the species also makes it very difficult to understand relationships. For these reasons a phylogenetic study must wait until the species are better known.

### *Calliscarta* Stål

*Calliscarta* Stål 1869: 82 (type-species *Cicada decora* Fabricius); Dallas 1870: 497; Van Duzee 1890: 35; Van Duzee 1890: 79; Schulze, Kükenthal, and Heider 1927: 504; Neave 1939: 537; Evans 1947: 230; Linnavuori 1959: 27; Linnavuori and Heller 1961: 3; Metcalf 1967: 946.

*Idiotettix* Osborn 1929: 465 [type-species *Thamnotettix magnificus* Osborn (= *Cicada decora* Fabricius)]; Oman 1938: 355; Neave 1939: 763; Metcalf 1944: 161; Evans 1947: 192; Evans 1951: 9; Nast 1952: 1; Maldonado Capriles 1954: 247; Metcalf 1966: 225.

Large, robust, wedge shaped. Head wider than pronotum; crown wide, same length near

eyes as median, coronal suture short; ocelli on the margin about twice their width from eyes, face elongate; postclypeus convex and long, sutures along each side starting near ocelli, with antennal ledges from postclypeus to eye. Pronotum convex, lateral margins short, posterior margin slightly but evenly emarginate. Forewing truncate, appendix well developed, with three subapical cells. Femur of hind leg with spinulation 2-2-1. Male genitalia large and mostly sclerotized. Anal tube long, cylindrical, heavily sclerotized. Pygofer always with a membranous ventral process that extends into the genital capsule, or with a long ventral process.

This genus has been previously placed in the subfamily Idiocerinae on the basis of the overall shape of the body and the large appendix. It has also been placed in the subfamily Deltocephalinae, as the ocelli are on the margin of the head near the eyes. These and other characters, plus the fact that the majority of the species are brightly colored and larger than those found in the above-mentioned subfamilies, caused Linnavuori (1959) to place this genus in the subfamily Neobalinae.

#### Key to Known Males

1. Aedeagus with extra dorsal apodemal process (Figs. 56, 57); pygofer with large ventral process (Fig. 55) ..... *fasciata* (Osborn)
- Aedeagus without extra apodemal process; pygofer with some type of apical process ..... 2
- 2(1). Aedeagus with shaft laterally compressed, knife-shaped, and with or without small lateral processes (Figs. 10, 11, 14, 15) ..... 3

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- Aedeagus with shaft tubular (Figs. 24, 25) . . . 10
- 3(2). Style with a lateral subapical tooth (Fig. 4) . . . 4
- Style without subapical tooth . . . . . 5
- 4(3). Pygofer truncate with a small apical process (Fig. 1) . . . . . *decora* (Fabricius)
- Pygofer gradually narrowing to bluntly pointed apex, median of ventral margin with two small teeth . . . . . *tartessoides* Linnavuori & Heller
- 5(3). Pygofer with apical process bifurcate (Figs. 13, 17, 18) . . . . . *boliviana* (Osborn)
- Pygofer with apical process not bifurcate (Fig. 19) . . . . . 6
- 6. Pygofer with apical process dorsally produced and pointed (Fig. 5) . . . . . 7
- Pygofer with apical process bird-head-shaped (Fig. 9) . . . . . 8
- 7. Style thickened to near apex (Fig. 8); aedeagus with small lateral processes (Figs. 6, 7) . . . . . *elongata*, n. sp.
- Style narrowing to pointed apex (Fig. 46); aedeagus with conspicuous processes (Figs. 44, 45) . . . . . *delicata*, n. sp.
- 8. Aedeagus with conspicuous processes (Figs. 48, 49) . . . . . *ornata*, n. sp.
- Aedeagus without processes (Figs. 10, 11) . . . 9
- 9. Style long and abruptly curved subapically (Fig. 12) . . . . . *incita* (Nast)
- Style short and evenly curved near apex (Fig. 22) . . . . . *lora*, n. sp.
- 10(2). Style foot-shaped at apex (Fig. 26) . . . . . 11
- Style pointed at apex (Fig. 42) . . . . . 13
- 11(10). Aedeagus with shaft expanded at apex (Fig. 32) . . . . . *abrupta*, n. sp.
- Aedeagus with shaft not expanded at apex . . . 12
- 12(11). Aedeagus with small apical processes (Fig. 24) . . . . . *magna* (Osborn)
- Aedeagus with larger subapical processes (Fig. 28) . . . . . *expanda*, n. sp.
- 13(10). Aedeagus with processes expanded at base (Fig. 40) . . . . . *columbiana* (Nast)
- Aedeagus with thin, spinelike processes (Fig. 36) . . . . . 14
- 14(13). Aedeagus with gonopore basal to processes (Fig. 37) . . . . . *stigmata* (Nast)
- Aedeagus with gonopore apical to processes (Fig. 53) . . . . . *corvenda* Kramer

Key to Known Females

- 1. Pronotum longitudinally banded . . . . . 2
- Pronotum not so marked . . . . . 3
- 2(1). Seventh sternum unusually long, over twice length of sixth (Fig. 61) . . . . . *fasciata* (Osborn)
- Seventh sternum shorter, about twice or less length of sixth (Fig. 65) . . . . . *mexicana*, n. sp.
- 3(1). Seventh sternum truncate, with a median emargination . . . . . *rugosa*, n. sp.

- Seventh sternum not truncate, posterior margin usually rounded . . . . . 4
- 4(3). Head with a frontal margin, bright yellow and black . . . . . *marginata*, n. sp.
- Head rounded to face . . . . . 5
- 5(4). Ovipositor short, less than 2 mm in length (Fig. 63) . . . . . *acuta*, n. sp.
- Ovipositor long, more than 2 mm in length (Fig. 62) . . . . . 6
- 6(5). Seventh sternum with median emargination of posterior margin V-shaped (Fig. 59) . . . . . *ornata*, n. sp.
- Seventh sternum with median emargination of posterior margin U-shaped (as in Fig. 62) . . . . . *decora* (Fabricius)

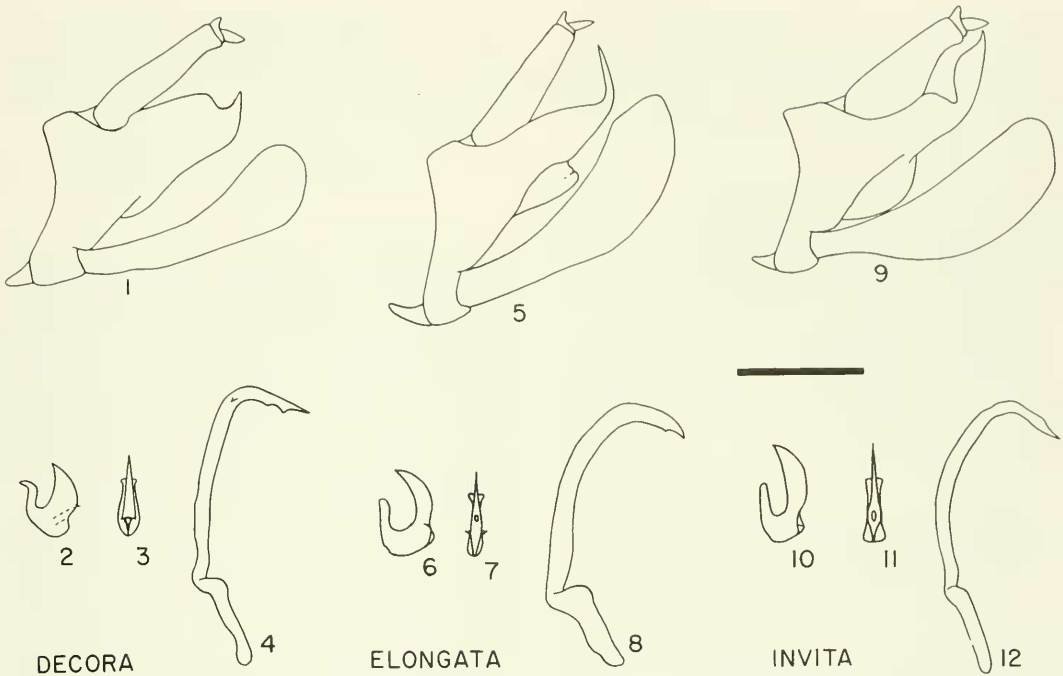
The *decora* species group is characterized by having orange transverse bands on the head, and the aedeagus laterally flattened and knife-shaped. The following seven species are placed in this group.

*Calliscarta decora* (Fabricius)

Figs. 1-4, 66

*Cicada decora* Fabricius 1803: 69. (South America, possibly from Brazil; Stockholm Museum).  
*Tettigonia decora*: Signoret 1853: 327; Walker 1858: 200; Dohrn 1859: 88.  
*Calliscarta decora*: Stål 1869: 83; Dallas 1870: 495; Distant 1908: 524; Evans 1947: 230; Linnavuori 1959: 29; Metcalf 1967: 946.  
*Thamnotettix magnificus* Osborn 1924: 424. (Cuatro Ojos, Santa Cruz, Bolivia; Carnegie Museum).  
*New synonymy*  
*Idiotettix magnificus*: Osborn 1929: 465; Oman 1938: 395; Evans 1947: 192; Nast 1952: 1; Maldonado Capriles 1954: 250; Metcalf 1966: 227.  
*Calliscarta magnifica*: Linnavuori 1959: 28.  
*Idiotettix festinus* Maldonado Capriles 1954: 248. (Cumucumuma River, F. T. Amazonas, Venezuela; U.S. National Museum).

Length of males 9.5-11.5 mm.; female 12 mm. Head reddish yellow above antennal sockets, yellow below, with three orange transverse bands, one just above and one just below ocelli and the other above base of antennae. Pronotum reddish yellow with two darker red transverse bands, one along anterior margin and one across middle, and one yellowish green band along posterior margin continuing to anterior of lateral margins near eyes. Scutellum reddish brown. Forewing generally dark reddish brown, claval area lighter brown with four large, yellowish green spots, costal margin red, and a row of six to eight large, yellowish green spots through middle of wing from base to appendix, apex



Figs. 1-4. *Calliscarta decora* (Fabricius), from Peru; 1, lateral view of male genital segments; 2, lateral view of aedeagus; 3, ventral view of aedeagus; 4, ventrolateral view of style.

Figs. 5-8. *Calliscarta elongata*, n. sp., holotype; 5, lateral view of male genital segments; 6, lateral view of aedeagus; 7, ventral view of aedeagus; 8, ventrolateral view of style.

Figs. 9-12. *Calliscarta invita* (Nast), from Ecuador; 9, lateral view of male genital segments; 10, lateral view of aedeagus; 11, ventral view of aedeagus; 12, ventrolateral view of style. All drawn to the same scale; the line equals 1 mm.

smoky brown. Ventral surface entirely yellow.

**MALE GENITALIA.**—Pygofer truncate with a short, apical, spinelike process (Fig. 1). Genital plates large, roundedly expanded at apex (Fig. 1). Style long, bent at right angle three-quarters of distance from base, apex pointed with a subapical tooth on inner margin, and a small but distinct spine at the bend (Fig. 4). Aedeagus short, laterally flattened, broad in lateral view, apex pointed, with a pair of small processes on caudal margin near gonopore (Figs. 2, 3).

**FEMALE GENITALIA.**—Seventh sternum large, twice length of sixth, with a shallow, median, U-shaped emargination similar to *ornata*.

**TYPE.**—Holotype male of *decora* not seen, but illustrated by Linnavuori (1959). Type is from South America, and Dohrn (1859) gave Brazil as the possible type locality.

**DISTRIBUTION.**—Known are specimens from: **BOLIVIA:** one female, Cuatro Ojos, November 1913, Steinbach Coll., (holotype of

*magnificus*) Carnegie Museum. **BRAZIL:** one male, ? (holotype of *decora*) Stockholm Museum. **ECUADOR:** one male, Pompeya, 13-25 May 1965, Luis E. Peña Coll., Ramos Collection; one male, Coca, May 1965, Luis E. Peña Coll., Ramos Collection; two males, Napo, Prov. Limoncocha, 10 June 1977, Dave L. Vincent Coll., U.S. National Museum. **FRENCH GUYANA:** one male, Cabret République, 29 August 1975, Guyane Française Mission M. Boulard, et P. Pompanon Coll., Muséum Paris. **GUYANA:** one male, Bartica, 20-30 March 1901, H. S. Parish Coll., (allotype of *magnificus*) Ohio State University Collection. **PERU:** four males, Avispas, October 1962, Luis E. Peña Coll., Ramos Collection. **VENEZUELA:** one male, Cunucunuma River, F. T. Amazonas, 28 April 1950, J. Maldonado Capriles Coll. (holotype of *festivus*) U.S. National Museum; one male, Anacoco, Bolivar, 60 M, 6°5'N:61°8'W, 10-30 August 1979, Expedicion La Salle, University of Central Venezuela Collection.

**NOTES.**—This species appears to be widely

distributed in South America but is poorly represented in collections. Much confusion concerning the identification of this species has occurred because the color pattern is not fully developed in some specimens. However, this species can be quickly recognized by the small spine on the male style, which is found on only one other known species, *tartessoides*. For now the female must be recognized by the color pattern, which is the same as in the male.

The types of *magnificus* and *festivus* were examined and found to represent the same species. Linnavuori (1959) synonymized *festivus* with *decora*.

*Calliscarta tartessoides* Linnavuori & Heller

*Calliscarta tartessoides* Linnavuori & Heller 1961: 3.  
(Hacienda Mascoitania, Peru; Staatlichen Museum für Naturkunde, Stuttgart).

This species was illustrated when described, and no additional information can be added at this time. It appears to be closely related to *decora*.

Length of male 9.5 mm; female unknown. Brownish yellow. Head light yellow, with a reddish orange transverse band across vertex between eyes; face with an orange transverse band between ocelli and another across middle of face, and a dark brown spot underneath each ocellus. Pronotum with anterior margin light yellow, posterior two-thirds darker marbled with darker orange. Scutellum faintly dark orange. Forewing mostly translucent, with veins brown; costal vein darker brown in middle. Ventral surface light yellow with some yellow-orange and brown markings on legs and abdomen.

MALE GENITALIA.—Pygofer narrowing to a posteriorly projecting, bluntly pointed apex, with two small spines on ventral margin near middle. Genital plates large and truncate at apex. Style long, bent laterally on apical fourth, apex pointed, a small subapical tooth on inner margin. Aedeagus laterally flattened, knife-shaped, without noticeable processes, gonopore on ventral margin near middle of shaft.

TYPE.—Holotype (male), PERU, Hacienda Mascoitania, 10–12 November 1957, Urwald Coll., Staatlichen Museum für Naturkunde, Stuttgart.

NOTES.—This species is known only from the type specimen, which I have not seen. It is

a species like *decora*, with a tooth on the style, but a color pattern that is more like *magna*. More material is needed to properly place this species.

*Calliscarta elongata*, n. sp.

Figs. 5–8

This species resembles *decora* in general appearance, but with different male genitalia.

Length of males 10–10.1 mm; female unknown. Head creamy yellow, crown having a red-violet tinge, with four orange transverse bands, one across middle of crown between eyes, one just below ocelli, two fainter bands across postclypeus; a black band on each side from base of antenna to anteclypeus along side of postclypeus. Pronotum orange, with a band along posterior margin and two central spots greenish yellow. Scutellum orange with a small yellow spot in middle of each lateral margin. Forewing orange anteriorly, fading to brown posteriorly, median of costal vein with a reddish tinge, four greenish yellow spots on clavus, three at base and one near middle, four yellow spots on corium, apical cells smoky brown with an L-shaped translucent spot pattern. Ventral surface generally creamy yellow, fore tibiae and tarsi brownish yellow.

MALE GENITALIA.—Pygofer narrowing to apex, apex a dorsally projecting, pointed process (Fig. 5). Genital plate enlarged and expanded on apical half, apex bluntly rounded (Fig. 5). Style stout, uniform width throughout, hooked apically, apex with a very small subapical tooth (Fig. 8). Aedeagus laterally flattened, knife-shaped, gonopore medially on ventral margin, a pair of small lateral processes basal to gonopore (Figs. 6, 7).

TYPE.—Holotype (male), ECUADOR, Napo, Lago Agrio (18 km E), 28 August 1975, Río Aguarico, collected on gravel bar at black-light, Langley, Cohen, Cantor, Yingling Coll., Ecuador–Peace Corps–Smithsonian Institution Aquatic Insect Survey, in the U.S. National Museum. Paratypes: ECUADOR, one male, same data as holotype, except 23 September 1975 and Andrea Langley Coll., University of Kentucky Collection; one male, same data as holotype, except 19 September 1975 and Andrea Langley Coll., U.S. National Museum; PERU, Avispas, October 1962, Luis E. Peña Coll., Ramos Collection.

*Calliscarta invita* (Nast)

Figs. 9–12

*Idiotettix invitus* Nast 1952: 3. (Santa Inez, Ecuador, Polish Museum of Zoology); Maldonado Capriles 1954: 250; Metcalf 1966: 226.

*Calliscarta invita*: Linnavuori 1959: 30; Linnavuori and Heller 1961: 3.

Length of males 10–10.6 mm; female unknown. Head brownish yellow, with a tinge of violet on crown and postclypeus; an orange transverse band across middle of crown between eyes, another orange transverse band below ocelli, two brownish orange transverse bands on postclypeus, a black band on each side from base of antennae to anteclypeus along sides of postclypeus. Pronotum mostly orange brown, lateral margins yellow. Scutellum light brown. Forewing light brown, with veins and obscure spots darker brown, median of costa reddish orange, small, white, translucent spots on clavus and corium; apical area smoky brown with three translucent spots. Ventral surface mostly brownish yellow, brown spot on propleura and sterna, fore legs with most of tibiae and entire tarsi brown, middle legs with base and apex of tibiae and entire tarsi brown.

MALE GENITALIA.—Pygofer truncately narrowed to apex, which is projected slightly dorsad in the shape of a bird's head (Fig. 9). Genital plate large, expanded in lateral view, truncate (Fig. 9). Style elongate, even width throughout, hooked apically, with a pointed apex (Fig. 12). Aedeagus laterally flattened, knife-shaped, without processes, gonopore on ventral margin near base of shaft (Figs. 10, 11).

TYPE.—Holotype (male), ECUADOR, Santa Inéz, R. Haensch Coll., Polish Museum of Zoology.

DISTRIBUTION.—Five males are known for this species. Linnavuori and Heller (1961) reported two males from PERU, Hacienda Mascoitania, 10–12 September 1957, Urwald Coll., Staatlichen Museum für Naturkunde, Stuttgart. I have seen two males from ECUADOR, Río Margajita, Río Pastaza, 1250 m, 20 March 1939, F. M. and H. H. Brown Coll., University of Kansas Collection.

*Calliscarta boliviana* (Osborn)

Figs. 13–18

*Idiotettix bolivianus* Osborn 1929: 466. (Coroico, La Paz, Bolivia, Ohio State University Collection); Oman

1938: 395; Nast 1952: 1; Maldonado Capriles 1954: 250; Metcalf 1966: 225.

*Calliscarta boliviana*: Linnavuori 1959: 29.

*Calliscarta tinga* Kramer 1963: 205. (Tingo María, Huamco, Peru, U.S. National Museum). *New synonymy*

Length of males 9.1–10 mm; female unknown. General color as in *invita*, pronotum with a band of yellow along posterior margin and lateral margins and white, translucent spots on forewings less conspicuous.

MALE GENITALIA.—Pygofer quite variable, narrowing to near apex, which projects dorsad in some type of bifurcate process (Figs. 13, 17, 18). Genital plates greatly expanded on apical half (Fig. 13). Style elongate, narrowing slightly to apex, hooked apically, apex with a ventral subapical tooth (Fig. 16). Aedeagus laterally flattened, knife-shaped, gonopore on ventral margin near base of shaft, with a small pair of laterally projecting processes basal to gonopore (Figs. 14, 15).

TYPE.—Holotype (male), BOLIVIA, Coroico, Ohio State University Collection.

DISTRIBUTION.—This species is known from 10 male specimens. Besides the two types, I have seen: BOLIVIA, one male, Cristal Mayn, Chapare, 28 August 1949, L. E. Peña Coll., University of Kansas Collection; PERU, four males, Avispas, September 1962, Luis E. Peña Coll.; two males, Quincemil, August 1962, Luis E. Peña Coll., Ramos Collection, and one from each locality in University of Kentucky Collection; PANAMA, El Volcán de Chiriqui, 26 February 1936, W. J. Gertsch Coll., American Museum of Natural History.

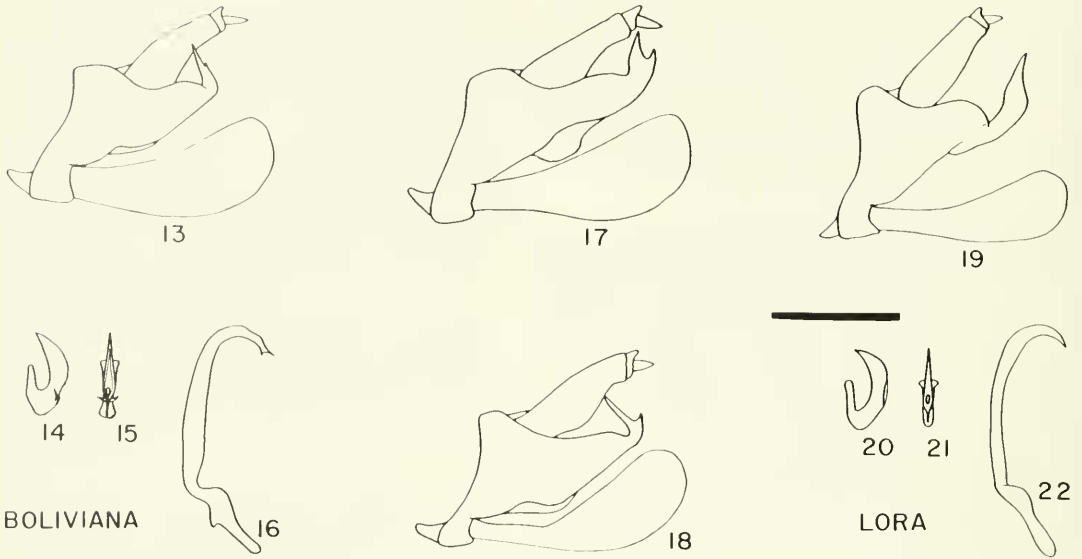
NOTES.—This species is quite variable in the shape of the apex of the pygofer, but it is the only species of the genus with the apex bifurcate. No two specimens seen have the same shape, and I consider this to be just a variation at this time; however, this may prove to be a complex of very closely related species.

*Calliscarta lora*, n. sp.

Figs. 19–22

This species resembles *invita* in general appearance, but with distinct male genitalia.

Length of male 9.3–9.9 mm; female unknown. Head, pronotum, and scutellum as in *elongata*. Forewing with clavus mostly orange, with three yellow spots, two transverse spots anteriorly, one longitudinal spot along posterior part of claval suture; corium brown,



Figs. 13-16. *Calliscarta boliviana* (Osborn), holotype: 13, lateral view of male genital segments; 14, lateral view of aedeagus; 15, ventral view of aedeagus; 16, ventrolateral view of style.

Figs. 17-18. Lateral views of male genital segments of other specimens of *C. boliviana* from Bolivia.

Figs. 19-22. *Calliscarta lora*, n. sp., holotype: 19, lateral view of male genital segments; 20, lateral view of aedeagus; 21, ventral view of aedeagus; 22, ventrolateral view of style. All drawn to the same scale; the line equals 1 mm.

median of costal vein with a reddish tinge, with four yellow spots, two at base, one (sometimes two) above reddish tinge of costa, and one a continuation of longitudinal spot on clavus; apical cells smoky brown, with three small, translucent spots. Ventral surface creamy yellow, fore tibiae and tarsi brownish yellow.

**MALE GENITALIA.**—Pygofer narrowing to apex that extends as a large bird's-head-shaped process (Fig. 19). Genital plate gradually expanding to a large, truncate apex (Fig. 19). Style elongate, hooked apically, with a pointed apex (Fig. 22). Aedeagus laterally flattened, knife-shaped, gonopore on ventral margin near middle, without processes (Figs. 20, 21).

**TYPE.**—Holotype (male), PERU, Quincemil, August 1962, Luis E. Peña Coll., in the Ramos Collection but will be deposited in U.S. National Museum through courtesy of Dr. Ramos. Paratypes: PERU, two males, same data as holotype; one male, Quincemil, October 1962, Luis E. Peña Coll.; two males, Avispas, September 1962, Luis E. Peña Coll., three in the Ramos Collection and two in the University of Kentucky Collection.

**NOTES.**—This species has a distinct color pattern and male genitalia that make it possi-

ble to separate it from other known species that also occur in Peru.

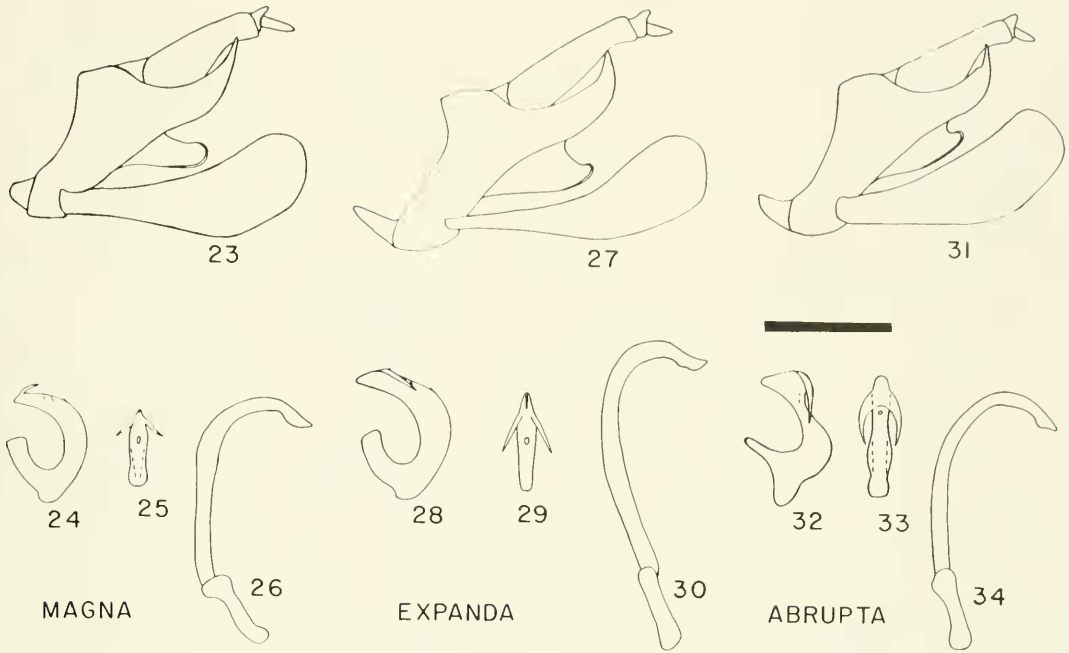
*Calliscarta delicata*, n. sp.

Figs. 43-46

This species resembles *invita* in general appearance, but with distinct male genitalia.

Length of male 8.5-10.1 mm; female unknown. Head yellow, with four orange transverse bands, one above ocelli, one below ocelli, one between antennae and one along lower margin of postclypeus. Pronotum orange, with green posterior margin extending along lateral margins and a green transverse band in anterior half. Scutellum mostly orange. Forewing generally smoky brown, with claval suture, anterior third of costa, and small spots at ends of claval veins green; costa red near middle; corium with two orange bands extending from near base to apical veins, one along claval suture, other along costa; apical cells smoky brown with three transverse, opaque spots. Abdominal segments orange.

**MALE GENITALIA.**—Pygofer narrowing to somewhat expanded apex, with a dorsally projecting, apical, pointed process (Fig. 43). Genital plate gradually expanded to a large, truncate apex (Fig. 43). Style narrowing and



Figs. 23–26. *Calliscarta magna* (Osborn), from Brazil: 23, lateral view of male genital segments; 24, lateral view of aedeagus; 25, ventral view of aedeagus; 26, ventrolateral view of style.

Figs. 27–30. *Calliscarta expanda*, n. sp., holotype: 27, lateral view of male genital segments; 28, lateral view of aedeagus; 29, ventral view of aedeagus; 30, ventrolateral view of style.

Figs. 31–34. *Calliscarta abrupta*, n. sp., holotype: 31, lateral view of male genital segments; 32, lateral view of aedeagus; 33, ventral view of aedeagus; 34, ventrolateral view of style. All drawn to the same scale; the line equals 1 mm.

curving laterally near pointed apex (Fig. 46). Aedeagus laterally compressed with a pair of long, curved processes from base of shaft, gonopore medially on ventral margin, apex bluntly pointed (Figs. 44, 45).

TYPE.—Holotype (male), PERU, Tingo María, 20 June 1982, Fisk, Ohio State University Collection. Paratypes: two males, same data as holotype, one in Ohio State University Collection and one in University of Kentucky Collection. Two males, BOLIVIA, El Palmar, Cochabamba, Chaparé, 8–15 September 1955, Luis E. Peña Coll., Ramos Collection.

NOTES.—This species can be separated from *invita* by the longer processes on the aedeagus.

The *ornata* species group is characterized by a single, transverse, black band on the face that replaces the orange transverse bands of the *decora* group, and by an aedeagus that is flattened and knife-shaped. Only one species, *ornata*, is placed here.

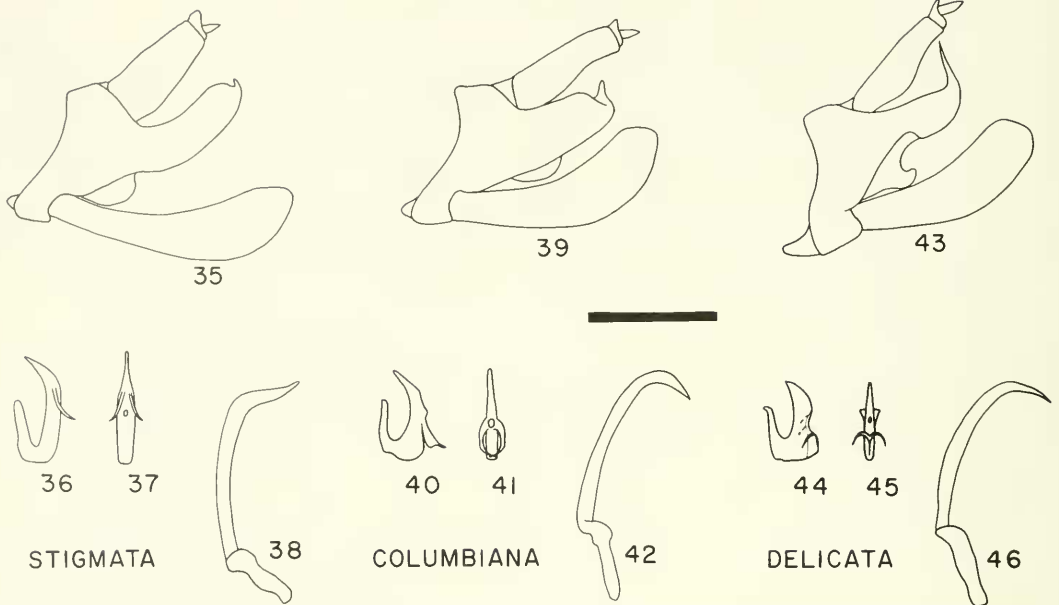
#### *Calliscarta ornata*, n. sp.

Figs. 47–50, 59, 67

This species resembles *invita* in general appearance, but with unique black band on face instead of usual orange bands.

Length of male 9.4–10.1 mm; female 10–11 mm. Head creamy yellow with a reddish tinge; an irregular, black, transverse band below ocelli, a large, black spot in middle of postclypeus, a black, V-shaped band from antennal bases along sides of postclypeus over entire anteclypeus. Pronotum creamy yellow, with a large, irregular, transverse, brown band across middle, posterior margined with greenish yellow. Scutellum mostly creamy yellow. Forewing brown, with many large, greenish yellow spots, apical cells smoky brown, with two large, translucent spots.

MALE GENITALIA.—Pygofer narrowed to a truncate apex, with a large, nearly bird's-head-shaped apical process (Fig. 47). Genital plate large, greatly expanded at apex, which is bluntly rounded (Fig. 47). Style elongate,



Figs. 35–38. *Calliscarta stigmata* (Nast), from Colombia: 35, lateral view of male genital segments; 36, lateral view of aedeagus; 37, ventral view of aedeagus; 38, ventrolateral view of style.

Figs. 39–42. *Calliscarta columbiana* (Nast), from Colombia: 39, lateral view of male genital segments; 40, lateral view of aedeagus; 41, ventral view of aedeagus; 42, ventrolateral view of style.

Figs. 43–46. *Calliscarta delicata*, n. sp., holotype: 43, lateral view of male genital segments; 44, lateral view of aedeagus; 45, ventral view of aedeagus; 46, ventrolateral view of style. All drawn to the same scale; the line equals 1 mm.

hooked apically, with a pointed apex (Fig. 50). Aedeagus laterally flattened, knife-shaped, with a pair of recurved processes on ventral margin near base of shaft, gonopore on ventral margin just apical to bases of processes (Figs. 48, 49).

**FEMALE GENITALIA.**—Seventh sternum enlarged, rounded posterior margin with a large, median, V-shaped emargination (Fig. 59). Ovipositor extending twice its width beyond pygofer. Pygofer narrowing to apex in ventral view.

**TYPE.**—Holotype (male), FRENCH GUYANA, Saint-Elie, 30 August–2 September 1975, Guyane Française Mission, M. Boulard et P. Pompanon Coll., Paris Museum. Allotype (female), same data as holotype. Paratypes: FRENCH GUYANA, one female, Carbet Lavaud (Rive Surinamienne), 24–26 September 1975, Itani (Guyanes) Mission, M. Boulard, P. Jauffret et P. Pompanon Coll.; one female, Em Gouchure de la Crique Oyaricoulet, 23 September 1975, Itani (Guyanes) Mission, M. Boulard, P. Jauffret et P. Pompanon Coll.; one female, Alicoto-Oyapock-Guyane, 13 November 1969, Piège lumineux, Guyane Mission, Balachowsky, Gruner Coll., Oct.–

Nov. 1969, Paris Museum; BRAZIL, one female, Chapada, September, C. F. Baker Coll.; one female, Chapada, October, C. F. Baker Coll., U.S. National Museum; VENEZUELA, one male, San Carlos de Río Negro, T. F. Amazonas, 7–13 September 1982, A. Chacòn, G. Yepez Gil Coll.; one female, Sta. Lucía, T. F. Amazonas, 15–21 September 1982, A. Chacòn, G. Yepez Gil Coll.; one male, one female, Río Surukum, Carretera Sta., Elena Icabaru, Bolivar, 850 m, 19–31 January 1985, F. Fernandez Y., Anibal Chacòn, Jurg Demarmels Coll., University of Central Venezuela Collection.

**NOTES.**—This species can be easily separated from the known species of this genus on the basis of the dark band across the face.

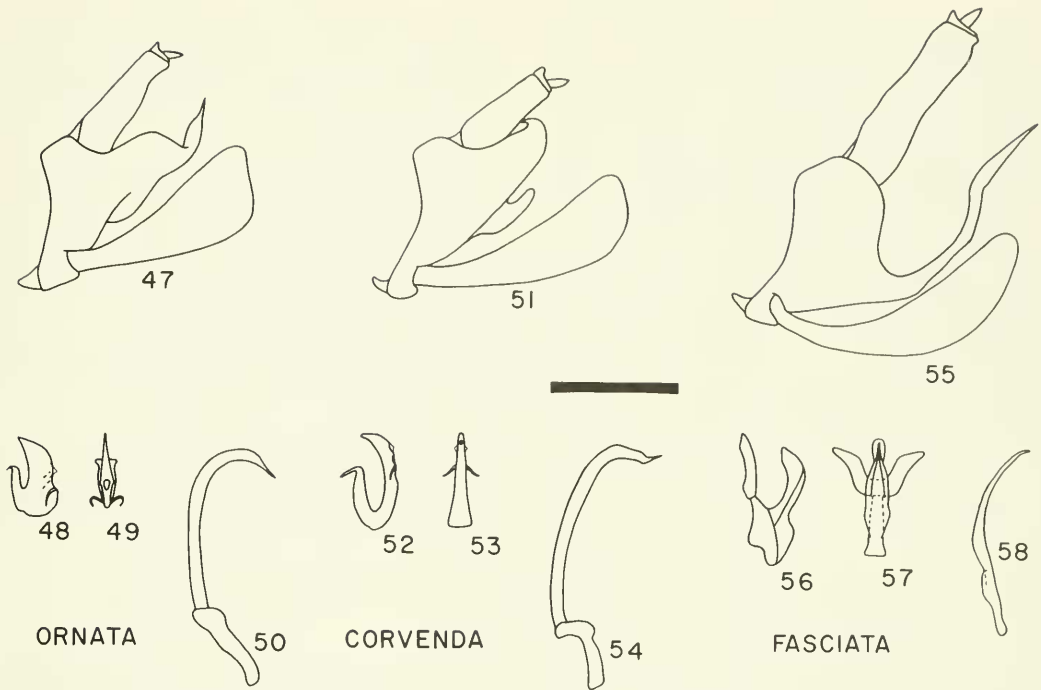
The *magna* species group is characterized by having the head mottled with brown and the aedeagal shaft tubular with apical or sub-apical processes. The following three species are placed in this group.

*Calliscarta magna*, (Osborn)

Figs. 23–26

*Idiocerus magnus* Osborn 1923: 13. (San Antonio de Guapore, Matto Grosso, Brazil, Carnegie Museum).





Figs. 47–50. *Calliscarta ornata*, n. sp., holotype: 47, lateral view of male genital segments; 48, lateral view of aedeagus; 49, ventral view of aedeagus; 50, ventrolateral view of style.

Figs. 51–54. *Calliscarta corvenda* Kramer, from Venezuela: 51, lateral view of male genital segments; 52, lateral view of aedeagus; 53, ventral view of aedeagus; 54, ventrolateral view of style.

Figs. 55–58. *Calliscarta fasciata* (Osborn), from Brazil: 55, lateral view of male genital segments; 56, lateral view of aedeagus with connector to anal tube; 57, ventral view of aedeagus and connector to anal tube; 58, ventrolateral view of style. All drawn to the same scale; the line equals 1 mm.

*Idiotettix magnus*: Maldonado Capriles 1954: 247; Metcalf 1966: 227.

*Calliscarta magna*: Linnavuori 1959: 30.

Length of male 9–10 mm; female unknown. Head, pronotum, and scutellum creamy yellow with a reddish violet tinge, greatly mottled with brown. Forewing mostly translucent, veins dark brown; clavus with a large, fuscous spot at middle and apex; apical cells smoky brown, with two transverse, translucent spots. Ventral surface mostly creamy yellow, with fore and middle legs with apex of tibiae and entire tarsi brownish yellow.

**MALE GENITALIA.**—Pygofer gradually narrowing to a pointed apex (Fig. 23). Genital plate large, greatly expanded on apical half (Fig. 23). Style elongate, hooked apically, apex bluntly pointed (Fig. 26). Aedeagus tubular, with pair of small, lateral, apical processes, gonopore subapical on ventral margin (Figs. 24, 25).

**TYPE.**—Holotype (male), BRAZIL, Rondônia, Santo Antonio de Guaporé (Rio Gua-

poré), 26 July 1909, Haseman Coll., Carnegie Museum.

**DISTRIBUTION.**—Known only from Brazil on the basis of the type and the following specimens: BRAZIL, five males, São Félice, Camp IV, Moyen Xingu, (Brésil) Mission, M. Boulard, P. Jauffret et P. Pompanon Coll., four in Muséum Paris and one in University of Kentucky Collection.

*Calliscarta expanda*, n. sp.

Figs. 27–30

This species resembles *magna* in general appearance, but with distinct male genitalia.

Length of male 9.7–10.5 mm.; female unknown. Head, pronotum, and scutellum creamy violet, mottled with brown. Forewing brown, with most cells translucent, veins dark brown; apical cells smoky brown, with three or four large, translucent, transverse spots. Ventral surface creamy yellow heavily marked with brown.

**MALE GENITALIA.**—Pygofer narrowing to a

pointed apex (Fig. 27). Genital plate large, expanded on apical half (Fig. 27). Style elongate, hooked apically, with apex bluntly pointed, notched subapically (Fig. 30). Aedeagus tubular, with subapical, large, lateral pair of processes, gonopore on ventral margin subapical to processes (Figs. 28, 29).

TYPE.—Holotype (male), ECUADOR, Napo, Lago Agrio, 19 September 1975, at black-light, Andrea Langley Coll., Ecuador—Peace Corps—Smithsonian Institution Aquatic Insect Survey, U.S. National Museum. Paratypes: ECUADOR, one male, same data as holotype, except 23 September 1975, (18 km E) Río Aguatico; two males, same data, except 28 August 1975, collected on gravel bar, Langley, Cohen, Cantor, Yingling Coll., U.S. National Museum; PERU, one male, Loreto, Ucayali R., Yarina Cocha, 24 September 1953, Peter Hocking Coll., Field Museum; one male, Quincemil, August 1962, Luis E. Peña Coll.; one male, Loromavo, September 1962, Luis E. Peña Coll., Ramos Collection; BOLIVIA, Rurrenbaque, 10–23 October 1956, Luis E. Peña Coll., Ramos Collection.

NOTES.—This species is similar to *magna*, but the aedeagus is larger and with longer, more subapical processes.

*Calliscarta abrupta*, n. sp.

Figs. 31–34

This species is related to *magna*, but with a distinctly different aedeagus.

Length of male 9.8 mm; female unknown. Head, pronotum, and scutellum mostly yellow tinted with red. Head with a small, brown spot behind each ocellus next to eye, another larger, brown spot below each ocellus next to eye. Postclypeus with brown dashes on each side and brown speckles over remainder of surface. Pronotum speckled with brown. Forewings mostly brown, claval area with opaque spots at ends of claval veins, costal vein yellow, two cell rows behind costal vein transparent, giving wing appearance of having a brown longitudinal band through middle, apical cells smoky brown with several large, opaque spots.

MALE GENITALIA.—Pygofer narrowing gradually to an upturned, pointed apex (Fig. 31). Genital plate enlarged on apical half, truncate (Fig. 31). Style nearly same width to apex, hooked apically, with apex foot-shaped (Fig. 34). Aedeagus tubular, with shaft bent at right

angle near middle, apex expanded with a pair of subapical large processes extending along sides of shaft halfway to base, gonopore on ventral margin just basal to processes (Figs. 32, 33).

TYPE.—Holotype (male), BOLIVIA, Rurrenbaque, 10–23 October 1956, Luis E. Peña Coll., in Ramos Collection but is being deposited in U.S. National Museum through courtesy of Dr. Ramos.

NOTES.—This species can be separated from the other species of the genus by the distinct aedeagus.

The *stigmata* species group is characterized by having the head mottled with brown, and the aedeagal shaft tubular with processes near middle. The following four species are placed in this group.

*Calliscarta stigmata* (Nast)

Figs. 35–38

*Idiotettix stigmatus* Nast 1952: 2. (Hac. Pehlke [probably Magdalena], Colombia, Polish Museum of Zoology); Maldonado Capriles 1954: 250; Metcalf 1966: 227.

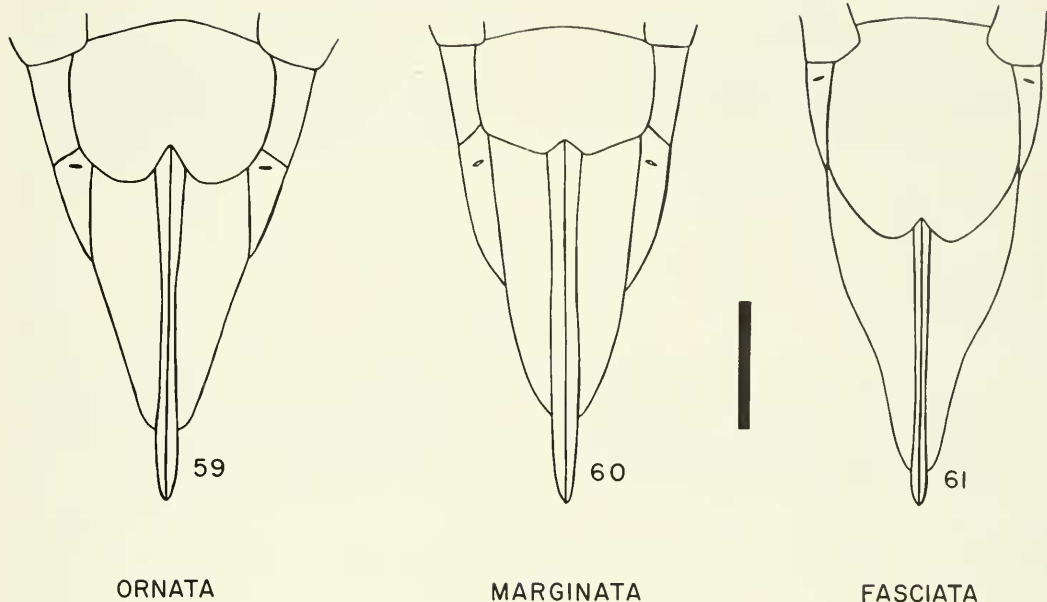
*Calliscarta stigmata*: Linnavuori 1959: 31.

Length of male 8.5–9.4 mm; female unknown. Head, pronotum, and scutellum grayish yellow tinged with violet, mottled with brown; orange bands of crown and face obscure. Forewing brown, with numerous whitish, translucent spots. Ventral surface brownish yellow; legs banded with brown.

MALE GENITALIA.—Pygofer narrowing to a long, tubular, apical area, apex with small, dorsally projecting process (Fig 35). Genital plate long, expended on apical half, bluntly rounded at apex (Fig. 35). Style long, bent apically, with pointed apex (Fig. 38). Aedeagus tubular, shaft elongate, apex bent dorsad and pointed, a pair of lateral processes at base of apical bend, gonopore basal to processes on ventral margin (Figs. 36, 37).

TYPE.—Holotype (male), COLOMBIA, Hacienda Pehlke, 1925, Pehlke Coll., Polish Museum of Zoology.

DISTRIBUTION.—This species is known from eight male specimens. The holotype and five paratypes are from Colombia and are in the Polish Museum of Zoology, and I have seen one male, COLOMBIA, Alban, Cund., 10 September 1965, J. A. Ramos Coll., Ramos Collection; and one male, VENEZUELA, Río Frío,



ORNATA

MARGINATA

FASCIATA

Figs. 59–61. *Calliscarta* spp., ventral view of female segments: 59, *C. ornata*, n. sp., allotype; 60, *C. marginata*, n. sp., holotype; 61, *C. fasciata* (Osborn), from Brazil. All drawn to the same scale; the line equals 1 mm.

Tachira, 600 m, 11–14 December 1980, J. A. Clavijo, A. Chacn, J. Ayala Coll., University of Central Venezuela Collection.

*Calliscarta colombiana* (Nast)

Figs. 39–42

*Idiotettix colombiana* Nast 1952: 2. (Hac. Pehlke [probably Magdalena], Colombia, Polish Museum of Zoology); Maldonado Capriles 1954: 250; Metcalf 1966: 226.

*Calliscarta colombiana*: Linnavuori 1959: 29.

Length of male 8–9.1 mm; female unknown. General color pattern as in *stigmata*, except lighter in color and legs only faintly banded with brown.

MALE GENITALIA.—Pygofer narrowing to truncate apex with a small, dorsad projecting process (Fig. 39). Genital plates large, expanded, truncate at apex (Fig. 39). Style elongate, hooked apically, with pointed apex (Fig. 42). Aedeagus semitubular, apex bluntly pointed, with a pair of basally expanded, lateral processes halfway to base, gonopore on ventral margin at base of processes (Figs. 40, 41).

TYPE.—Holotype (male), COLOMBIA, Hacienda Pehlke, 1921, Pehlke Coll., Polish Museum of Zoology.

DISTRIBUTION.—This species is known only

from Colombia from eight male specimens. The holotype and six paratypes are in the Polish Museum of Zoology, and I have seen one male, Alto Río Opon, Santander, January 1950, L. Richter Coll., Ramos Collection.

*Calliscarta corvenda* Kramer

Figs. 51–54

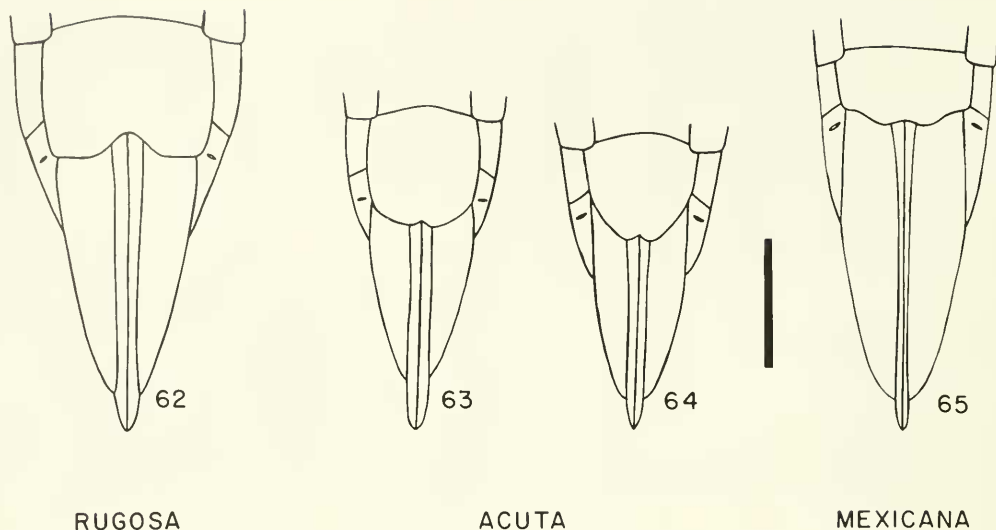
*Calliscarta corvenda* Kramer 1963: 210. (Covendo, La Paz, Bolivia, U.S. National Museum).

Length of male 9–9.8 mm.; female unknown. Color pattern similar to *stigmata*, except spots of forewings not forming rows or bands.

MALE GENITALIA.—Pygofer narrowing to inwardly hooked and pointed apex (Fig. 51). Genital plate large, expanded on apical half (Fig. 51). Style very elongate, hooked apically, with pointed, upturned apex (Fig. 54). Aedeagus semitubular, pair of lateral processes on ventral margin near middle of shaft, gonopore subapical on ventral margin (Figs. 52, 53).

TYPE.—Holotype (male), BOLIVIA, Covendo, August 1921, Mulford Biol. Expedition, Wm. M. Mann Coll., U.S. National Museum.

DISTRIBUTION.—Four specimens are known, including the type and a paratype from



Figs. 62–65. *Calliscarta* spp., ventral view of female segments: 62, *C. rugosa*, n. sp., holotype; 63, *C. acuta*, n. sp., holotype; 64, *C. acuta*, n. sp., paratype; 65, *C. mexicana*, n. sp., holotype. All drawn to the same scale; the line equals 1 mm.

Bolivia. Other specimens: VENEZUELA, two males, Barinitas, 15 km SW Barinas, 25 February 1969, Duckworth and Dietz Coll., one in U.S. National Museum and one in University of Kentucky Collection.

*Calliscarta rugosa*, n. sp.  
Figs. 62, 68

Resembling *columbiana* in general color pattern, but with lighter, more reddish brown markings.

Length of female 10.1 mm; male unknown. General color pattern as in *columbiana*, but with forewing darker and more reddish brown.

FEMALE GENITALIA.—Seventh sternum large, truncate, with a large, median, U-shaped emargination (Fig. 62). Ovipositor extending its length beyond pygofer.

TYPE.—Holotype (female), VENEZUELA, Aragua, El Limón, 450 m, 23 August 1979, Luz de Mercurio, F. Fernandez Y. Coll., University of Central Venezuela Collection.

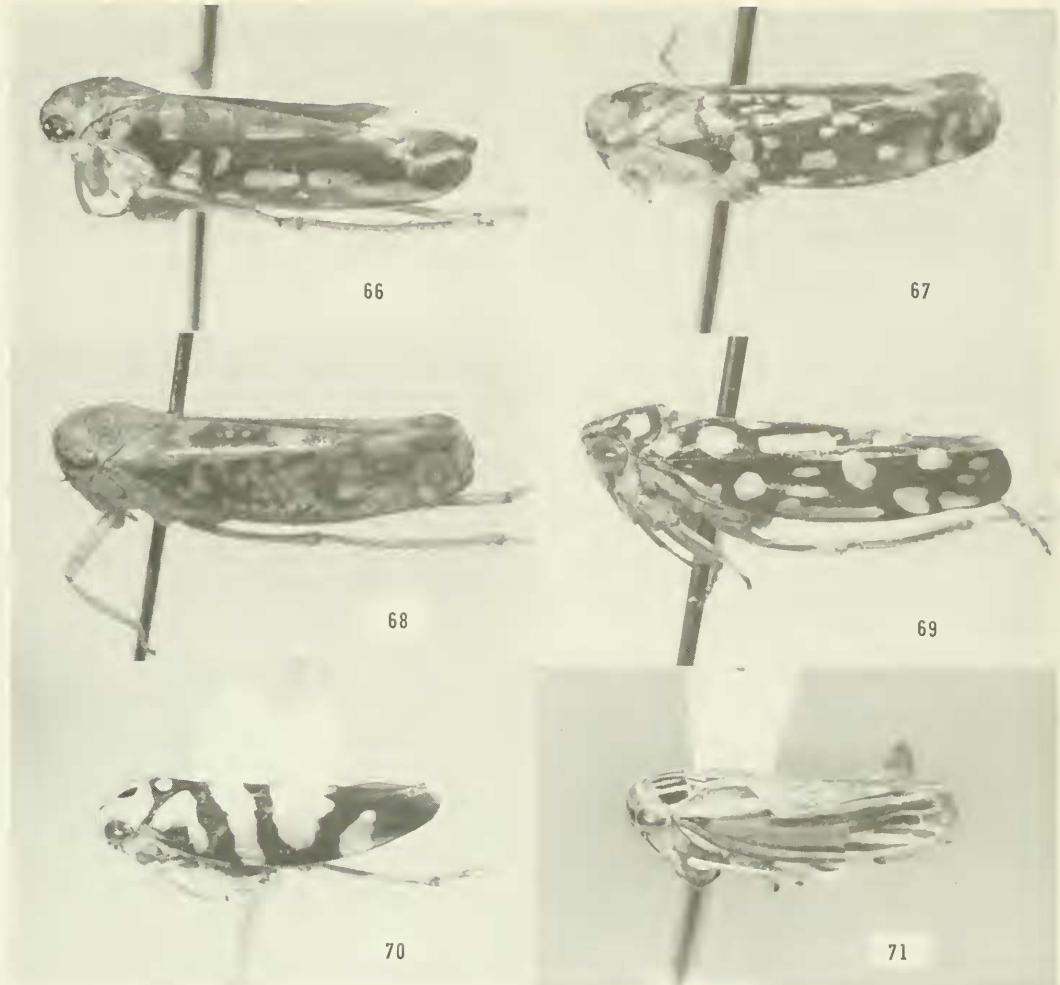
NOTES.—This female may be the female of *columbiana* or *corvenda*. However, since it was collected along the northern mountains of Venezuela, it is just as likely to represent a separate species. The color pattern is sufficiently different from the known species of the *stigmata* species group to warrant its description at present.

The following two species are not placed in a species group at this time, as the males are unknown and the color patterns give little indication as to how these relate to other known species. However, they are closer to the preceding groups than to the group following them.

*Calliscarta marginata*, n. sp.  
Figs. 60, 69

This species resembles *ornata*, but with a brighter color pattern and the anterior margin of the crown more distinct.

Length of female 10.5 mm; male unknown. Head creamy yellow with a U-shaped band in middle of crown, a wider U-shaped band behind eyes over ocelli and along anterior margin, two transverse bands between antennae and ocelli, two dashes in middle of lower part of postclypeus, and a V-shaped band from underneath eyes along lateral margins of postclypeus down middle of anteclypeus, black. Pronotum black, with a yellow longitudinal band down median; also a large, yellow spot on each side with a smaller cream spot near anterior margin between yellow spot and band. Scutellum black, with cream spots. Forewing black, with six large, yellow spots or dashes on clavus, eight large, yellow spots or dashes on corium, and four smaller cream spots in apical cells.



Figs. 66–71. *Calliscarta* spp., lateral aspect: 66, *C. decora* (Fabricius), male from Peru; 67, *C. ornata*, n. sp., male paratype from French Guyana; 68, *C. rugosa*, n. sp., female holotype; 69, *C. marginata*, n. sp., female holotype; 70, *C. acuta*, n. sp., female holotype; 71, *C. mexicana*, n. sp., female holotype.

**FEMALE GENITALIA.**—Seventh sternum large, with posterior margin with a median, V-shaped emargination (Fig. 60). Ovipositor extending beyond pygofer three times its width.

**TYPE.**—Holotype (female), HONDURAS, Com., Lago Yojoa, 19 July 1974, C. W. and L. B. O'Brien and Marshall Coll., the Ohio State University Collection.

**NOTES.**—This species is quite distinct from other members of the genus both in color pattern and in having a slight anterior margin of the head.

*Calliscarta acuta*, n. sp.

Figs. 63, 64, 70

Resembling *marginata*, this species is

smaller and has a distinctly different color pattern.

Length of female 8.9–9 mm; male unknown. Head creamy yellow, with a spot on either side of median near posterior margin of crown, a spot on either side of median on anterior margin of crown, an area around antennae down lateral margins of postclypeus, lora, and anteclypeus black. Pronotum creamy yellow with a large spot either side of median. Scutellum black with a median, orange spot. Forewing green, with three black bands, one at end of scutellum, one across middle, and one at end of clavus, apical cells black.

**FEMALE GENITALIA.**—Seventh sternum

large, roundedly produced, with a small, median, V-shaped emargination (Fig. 63). Ovipositor extending beyond pygofer nearly twice its width.

TYPE.—Holotype (female), VENEZUELA, T. F. Amazonas, 20 December 1981, eacuri, G. Yopez Gil Coll., University of Central Venezuela Collection. Paratype (female), PERU, Quincemil, August 1962, Luis E. Peña Coll., Ramos Collection.

NOTES.—The striking color pattern makes this species easy to identify. The two specimens differ slightly in color pattern and in the shape of the female genitalia, but this is probably individual variation as they come from quite different localities.

The *fasciata* species group is characterized by the longitudinal bands on the pronotum and the unusual, extra apodemal process on the aedeagus. The following two species belong to this group.

*Calliscarta fasciata* (Osborn)

Figs. 55–58, 61

*Idiotettix fasciatus* Osborn 1929: 466. (Hohenau, Itapua, Paraguay, Ohio State University Collection); Oman 1938: 395; Evans 1947: 190; Nast 1952: 1; Maldonado Capriles 1954: 248; Metcalf 1966: 226.

*Calliscarta fasciata*: Linnavuori 1959: 30.

*Idiotettix brunneus* Osborn 1929: 467. (Hohenau, Itapua, Paraguay, Ohio State University Collection); Oman 1938: 395; Nast 1952: 1; Maldonado Capriles 1954: 248; Metcalf 1966: 226. *New synonymy*

*Calliscarta brunnea*: Linnavuori 1959: 32.

*Idiotettix lautus* Nast 1952: 3. (Porto Epitacio, São Paulo, Brazil, Polish Museum of Zoology); Maldonado Capriles 1954: 248; Metcalf 1966: 227.

Length of male 8–9.5 mm; female 9.8 mm. Head yellow, with a transverse band above ocelli, one below ocelli, a spot on each antennal ledge, a pair of longitudinal bands on postclypeus, and much of gena and lora orange; a row of brown or black transverse lines on each side of postclypeus. Pronotum yellow, with anterior margin, four wide, longitudinal bands, and lateral margins orange. Scutellum yellow, with orange-brown longitudinal band down median. Forewings orange fading to smoky brown at apex; claval and discal veins bordered with translucent purple bordered with dark brown, apical half with large, irregularly shaped white spots bordered with brown, apical cells with whitish, translucent spots. Ventral surface mostly yellow.

MALE GENITALIA.—Pygofer large, truncate,

with a long process from ventral margin (Fig. 55). Genital plate large, expanded apical half, bluntly rounded at apex (Fig. 55). Style short, slightly curved laterad, with a pointed apex (Fig. 58). Aedeagus stout, curved dorsad apically, with a pair of lateral flanges from base of shaft to near apex, extra apodeme at base connecting aedeagus to anal tube (Figs. 56, 57).

FEMALE GENITALIA.—Seventh sternum greatly enlarged, rounded on posterior margin with a V-shaped, median emargination (Fig. 61). Ovipositor extending beyond pygofer its own width. Pygofer narrowed on apical third.

TYPE.—Holotype (male), PARAGUAY, Hohenau, Ohio State University Collection.

DISTRIBUTION.—This species is known from several hundred specimens from Brazil, Paraguay, and Peru. The only known female is in the University of Kansas Collection.

NOTES.—Linnavuori (1959) placed *lautus* as a synonym of *fasciatus*. The type of *brunnea* represents the general form of this species; consequently, it is placed in synonymy.

*Calliscarta mexicana*, n. sp.

Figs. 65, 71

This species resembles *fasciata*, but it is smaller and the apical area of the forewing is without large, transparent spots.

Length of female 8 mm; male unknown. Head creamy yellow, with a large, orange transverse band across middle of crown, an orange transverse band just below ocelli with ends below ocelli dark brown, an orange-brown transverse band across postclypeus halfway between antennae and ocelli with extensions down both sides of postclypeus as a brown longitudinal band to anteclypeus, and a dark brown area around bases of antennae extending along lateral margins of postclypeus. Pronotum creamy yellow with four wide, orange-brown longitudinal bands, median pair extending as brown longitudinal bands on scutellum. Forewing orange-brown with longitudinal bands of creamy white, one along costa, one along claval vein on clavus, one along commissure, as well as white areas along apical longitudinal veins.

FEMALE GENITALIA.—Seventh sternum slightly enlarged, with posterior margin roundedly produced with a slightly rounded median emargination (Fig. 65). Ovipositor extending only slightly more than its width beyond pygofer.

TYPE.—Holotype (female), MEXICO, Tamazunchale, S. L. Potosi, 19 June 1941, Henry S. Dybus Coll., Field Museum.

NOTES.—This species is very similar to *fasciata* in overall color pattern. These two species form a species group that is quite different from the other species of this genus.

#### ACKNOWLEDGMENTS

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